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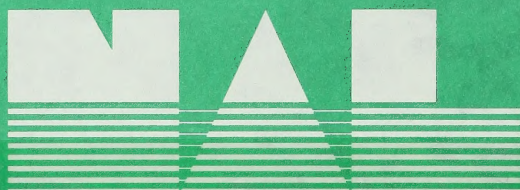
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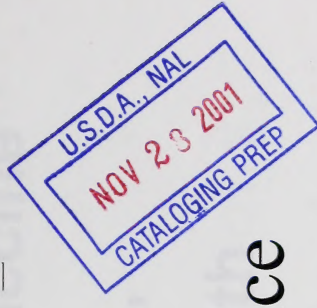
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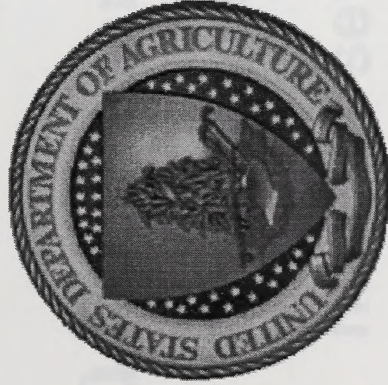


Agriculture, Biological Weapons and Terrorism





USDA Agricultural Research Service
Office of the Administrator

April 21, 2000





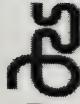
Scenario - Agricultural Bioterrorism

-  A terrorist group arranges for a single vial of FMD live culture from a rogue state vaccine plant. One courier transports vial (i.e., Amman, Athens, New York and LA) with virtually no risk of intercept.
-  In LA, agent rents a car and drives to Riverside County and merely swabs viral media on the nose of several dairy cows.

Agricultural Bioterrorism

FMD:

- ☐ Not present in the U.S. since the 1920's and little veterinary familiarity.
- ☐ U.S. will not allow sero-positive detections; therefore, eradication is the method to deal with an outbreak.
- ☐ O.I.E. classifies FMD an A List agent which must be reported immediately and evokes trade sanctions.

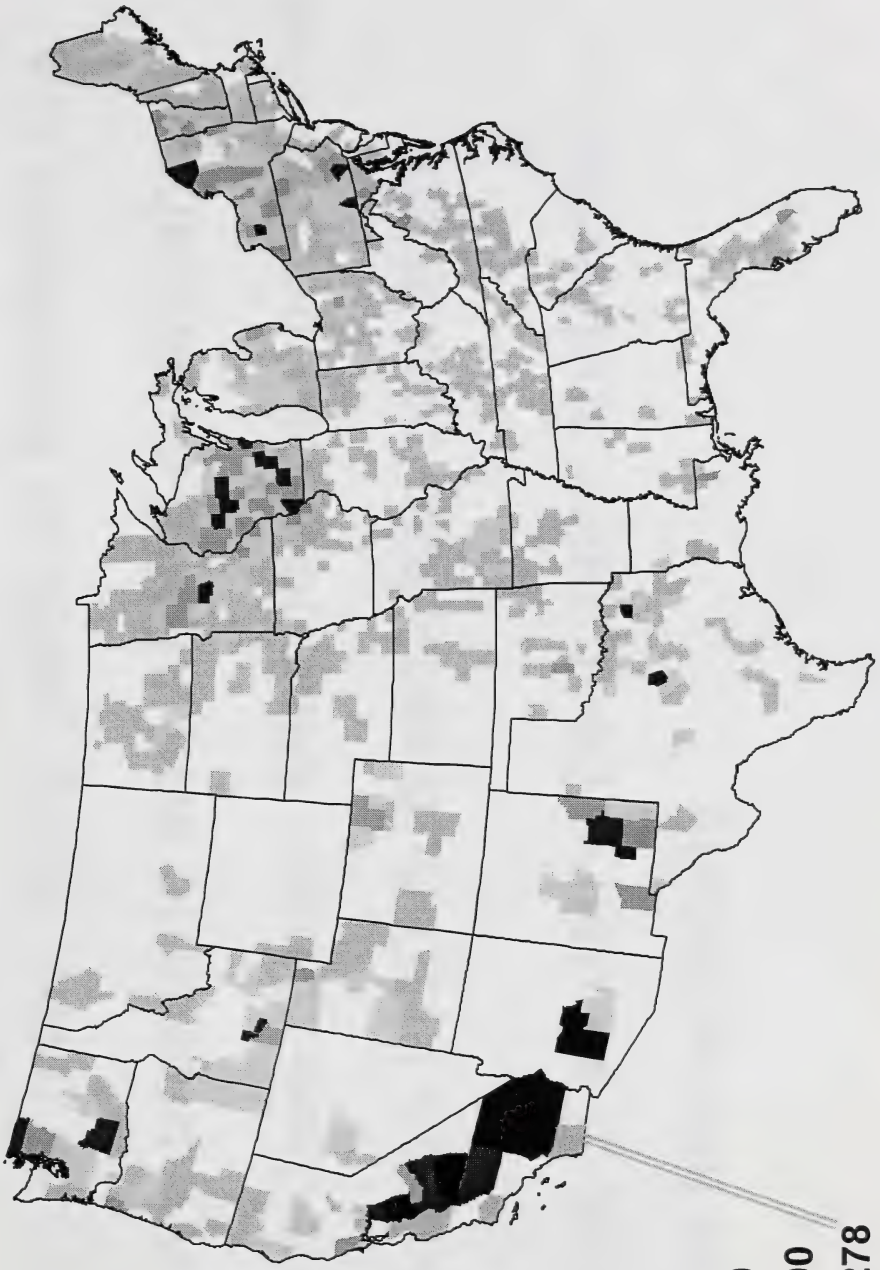


Agricultural Research Service

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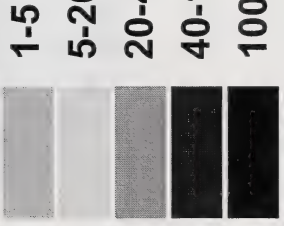


Target - So. California





Dairy Cows

1,000 Head





Scenario - Agricultural Bioterrorism

-  72 hours later, dairy cattle in Southern CA are symptomatic and APHIS establishes quarantine zones. Diagnostics confirm that indeed an FMD outbreak has occurred.
-  Export of all dairy, beef, pork and lamb cease immediately.



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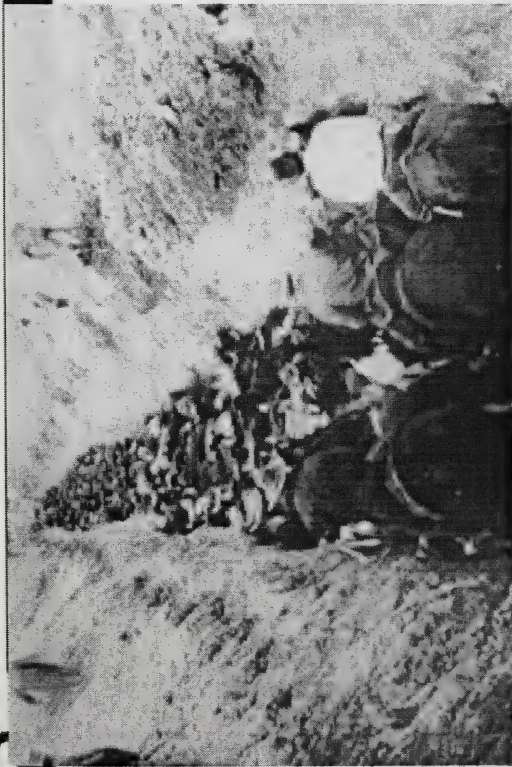
Mouth lesion

< FMD early onset



Consequences

- ❑ Total destruction of all hosts for FMD commences and carcasses are burned, covered in lime and buried. Based only on milk sales, CA suffers an economic loss of \$3.8 B / year. US loses \$>28 B / year.
- ❑ From press coverage, public outrage occurs and this could pull down the government (State possibly National ?).
- ❑ Inquiry panels convene and over several years conclusion is that, in fact, a bioterrorism attack occurred.





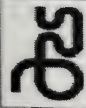
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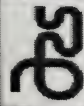
Courtesy of USDA - Animal and Plant Health Inspection Service - Veterinary Services





Foot and Mouth disease





- FMD virus most infectious virus known.
- Spread by aerosol on wind over 150 miles, also in beef bone marrow, meat products and carrier animals.
- Infects tonsils, then spreads to surfaces in rest of body.
- Forms blisters on tongue, lips, feet, teats and internally.



Foot and Mouth disease

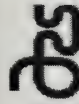
- U.S. led 8500 man quasi-military operation to eradicate FMD in Mexico 1946-1952, cost \$200 million, 16 U.S. dead.
- All infected and in-contact cattle, sheep and swine killed, burned or buried.
- FMD is an enormous logistical challenge that severely disrupts commerce and movement.

Agricultural Bioterrorism Agent Menu:

-  Rinderpest / morbillivirus / highly contagious / ungulates/ high lethality.
-  FMD, Foot-and-Mouth Disease / picornavirus / ungulates / variable lethality / super-contagious - *smallpox with an attitude.*
-  ASF, African Swine Fever / iridovirus / highly contagious / monocultural / extremely fatal.
-  Hog cholera / flaviviridae / highly contagious / monocultural / extremely fatal.

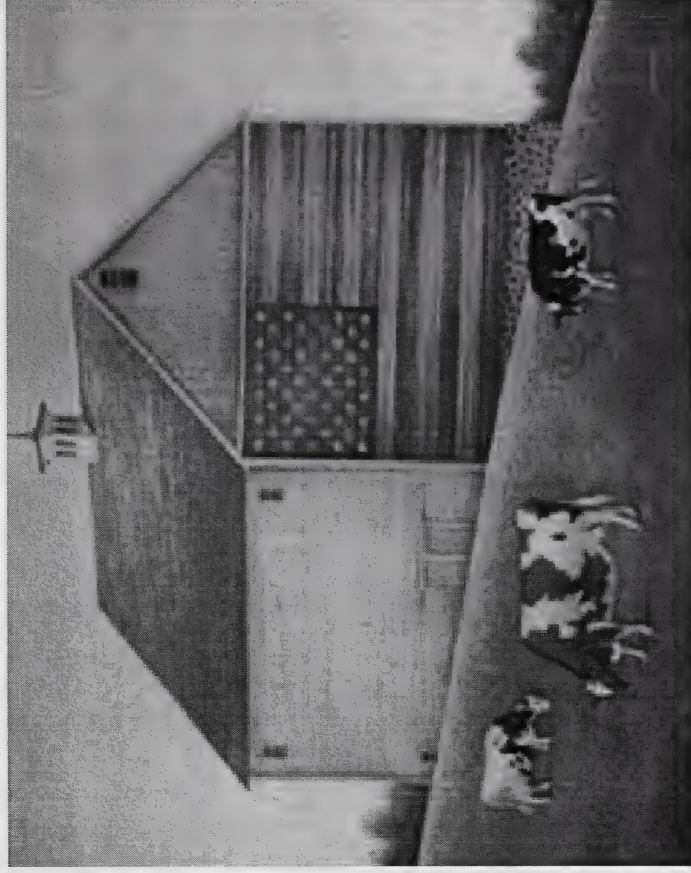
Consequences

- ❏ U.S. has no stated policy on retribution if and when an agricultural sector was attacked with a biological weapon.
- ❏ So, from this presentation:
 - biological attack is quite plausible
 - agents for such attack are readily available
 - economic consequences are significant
 - should evidence indict, possibly no reprisals
 - public confidence in government could be shattered



U.S. Agriculture

- Agriculture is 13.1% of GDP; 16.9% of employment.
- Exports alone are \$140 billion and 860,000 jobs.
- “The most reliable, secure and safe supply of food at a reasonable cost that the world has ever known.”
- Only about 2% involved in agriculture; remainder engages in the creation of wealth in other ways.



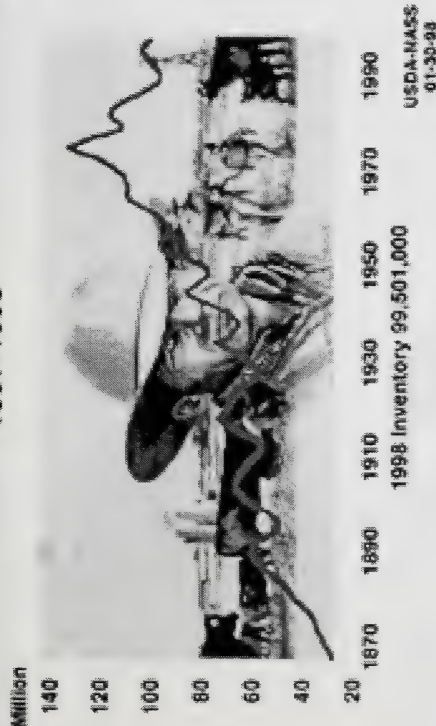


The Purpose

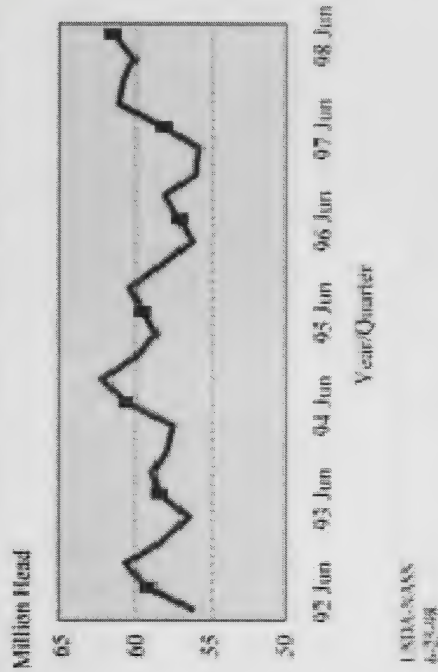
- This is not about food.
- The purpose is not to make our population go hungry, we have plenty of alternate foods.
- The purposes are: fear, disruption, economic, social and political pressures to change our will and our society.

- The U.S. has unique vulnerabilities to many natural pathogens and pests as well as engineered varieties

U.S. Cattle Inventory, January 1 1867-1998

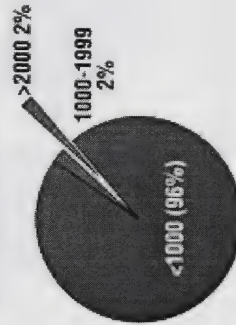


U.S. Department of Agriculture U.S. Quarterly Hogs and Pigs Inventory



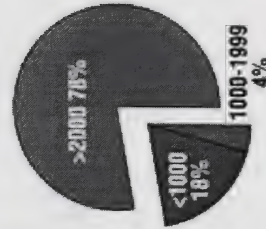
2% of Feedlots Produce 78% of Cattle

Cattle per Feedlot

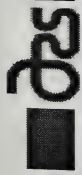


Total Feedlots
46,500

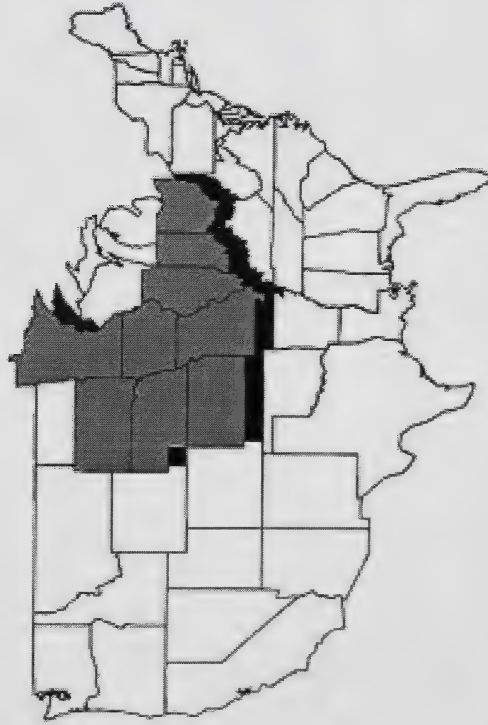
Cattle Marketed



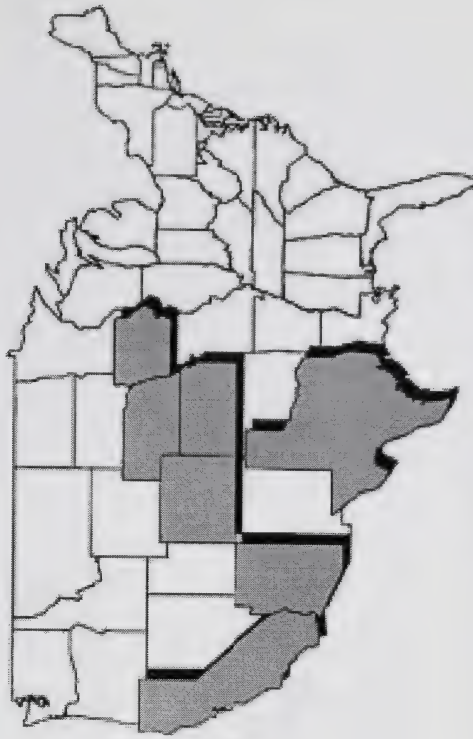
Total Cattle
28.8 million



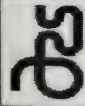
Food Producing Animals Are Highly Concentrated



74% of Swine



84% of Feedlot Cattle

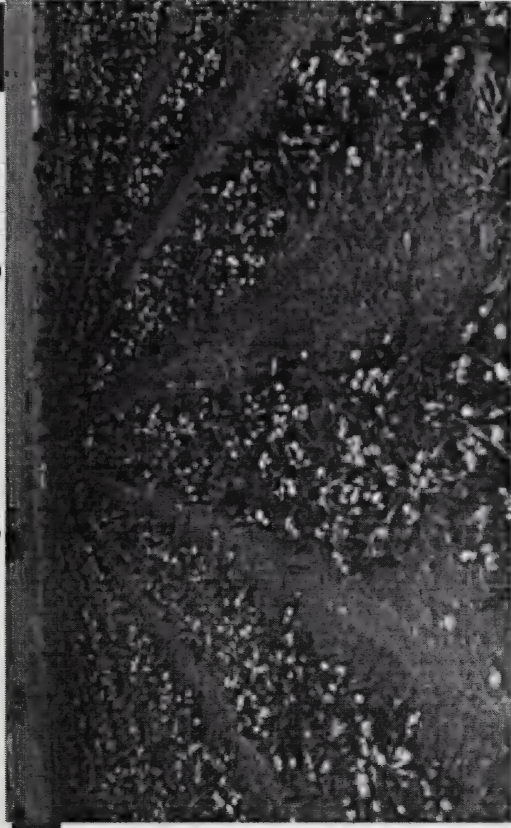


Crops

- A wide range of foreign pathogens and pests threaten U.S. crops
- The most dangerous pathogens are those that kill the plant close to harvest
- The genetic properties of these pathogens can be manipulated by design for benign or offensive purposes

Selected Plant Pathogens of Concern

- Karnal Bunt
- Stem Rusts
 - New race recently identified of wheat stem rust in the U. S.
- Leaf Rusts



Agriculture, biological weapons and terrorism

- The “Agricultural System” and the food supply need to be included in counter-terrorism planning.
- U.S. vulnerability is very high - Pathogens and pests are readily available, information on their use is on the Internet, manufacturing is easy, scientific knowledge and equipment required are minimal and widely available.
- U.S. crops and livestock are fully susceptible to many pathogens and pests that don’t occur here - there is no innate resistance or immunity.

Agriculture, biological weapons and terrorism

- The U.S. is not prepared: - unlikely to detect, identify and report - emergency responses are likely to prove inadequate - working relations would be deficient among the many responders - State and federal infrastructure would be overwhelmed.
- Certain non-monetary resources cannot be created on demand and may be unavailable - BSL 3 and 4 facilities, trained specialists.

Terrorism/WMD: The Threat To US Agriculture

- Current USDA mission addresses disease and pest outbreaks that occur naturally:
 - Control of foreign and domestic naturally-occurring pathogens and pests of animals and plants, and contaminants of the food supply, some of which also infect humans.
 - Existing USDA programs are designed to prevent, detect, and respond to these natural threats.
 - Risk assessments are based on natural patterns of occurrence and potential introduction into the US or into agricultural industries and the food supply system.
- Current funding is solely to accomplish this mission

Biosafety Level (BSL) - 4

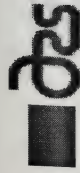
Definitions

- *Complete* Prevention of Contact Between Pathogen & Personnel
- Prevention of Pathogen Escape
 - RACAL Personnel Suits
 - Class 4 hoodline
 - chemical showers
- Necessary for R&D Involving
 - life-threatening zoonotic pathogens
 - pathogens for which prophylaxis unavailable

Biosafety Level (BSL) - 3

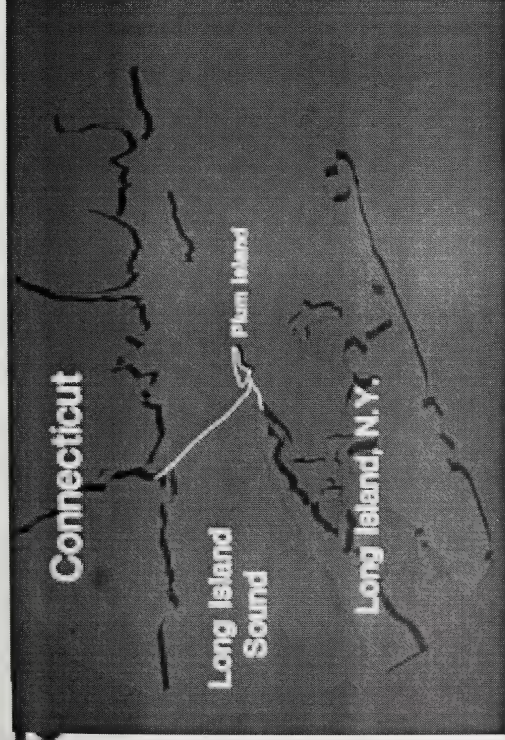
Definitions

- Designed to Prevent Microorganism Escape
 - HEPA filters
 - Negative Air Pressure
 - Controlled Movement
- Adequate for R&D Involving Pathogens
 - not life-threatening to humans
 - for which prophylaxis is available



USDA BSL-3 Facilities

- Required to protect U.S. Agriculture from very pathogens used in research & diagnosis
- Laboratories Located at:
 - Plum Island, New York
 - Ames, Iowa
 - Athens, Georgia
 - Laramie, Wyoming



Plum Island

- This off-shore island houses the USDA foreign animal disease research and diagnostic laboratories
- The extensive BSL-3 laboratories and animal rooms and their physical plant support are being renovated or replaced
- This is a unique hemispheric resource

USDA Laboratory Requirements

Real & Not Just Potential

- 1999 discovery of Nipah virus in Singapore & Malaysia
 - Zoonotic (affecting humans & swine)
 - 100+ Human Deaths
 - 50% of Human Infections Lethal
 - Hundreds of Thousands of Swine Killed
 - Malaysian Swine Industry Destroyed
 - CDC Currently Has Virus for Study
- Hendra virus outbreak - AUS in mid 90s

Biological Terrorism (characteristics):

- ☐ **Low-tech agent released, or threatened to be, by a zealot, sect or cult. May seek rogue state sponsorship.**
- ☐ **Intent is to draw recognition for cause, perceived injustice or leverage financial gain.**
- ☐ **Isolated / intended to have maximum publicity.**
- ☐ **Agents have good denial and deception potential for sponsor.**

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